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## PATENT SPECIFICATION

(11)

1452727

P802640/wch

- (21) Application No. 22618/75 (22) Filed 23 May 1975  
 (31) Convention Application No. 2446207 (32) Filed 27 Sept. 1974 in  
 (33) Germany (DT)  
 (44) Complete Specification published 13 Oct. 1976  
 (51) INT CL<sup>2</sup> B60R 19/02//B60Q 1/34 1/48 B60R 19/08  
 (52) Index at acceptance

B7J 68J

F4R 374 376 379 41Y 420 449 44Y 469 509 610 621  
628 62Y 632 653 731 773 774 77Y

## (54) A CORNER BUMPER SECTION FOR MOTOR VEHICLES

(71) We FORD MOTOR COMPANY LIMITED, of Eagle Way, Brentwood, Essex CM13 3BW, a British Company, do hereby declare the invention for which we pray that

5 a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to a corner bumper section for motor vehicles, which can be attached to the side of a substantially straight bumper centre section.

15 For stylistic reasons, as for example in body designs with low front and rear terminations, and partly also for technical reasons such as standardisation of bumper height, nowadays motor vehicles are often equipped in or beneath the corner zones of the bumpers, with light such for example as

20 side marker lights, profile lights, tail lights, wipers or fog lamps.

25 The fitting of lights beneath the corner zones of bumpers is not a good idea because in operation of the vehicle, these lights become relatively heavily fouled.

30 Therefore, there has recently been a marked tendency to arrange lights in openings or cut-outs in the corner zones of bumper bars. The openings and cut-outs in the corner zone makes the bumper weak at three locations and consequently the bumper loses its deflecting function. The weakened end zones of the bumpers are overstressed and remain distorted, even after the application of only small forces. The damaged lights or the corner zone of the bumper cannot generally be replaced and therefore the entire one-piece bumper has to be replaced.

40 The invention will now be described with reference to the accompanying drawings, in which:

45 Figure 1 illustrates a horizontal section through a bumper corner section embodying the invention;

Figure 2 illustrates a section on the line II—II of Figure 1; and

Figure 3 illustrates a modification of the

attachment means marked by a circle X in Figure 1.

A bumper corner section 1 shown in Figure 1 consists of a metal insert 2 and a synthetic material moulding 3. The synthetic material moulding 3 can be attached to the metal insert 2 by moulding it in situ there, vulcanising it in position or producing it in situ in a foamed product, depending upon whether it is thermoplastic, rubber or foamed material which is being used.

The design of the bumper corner section 1 is contrived in such a manner, taking into account the synthetic material used and the nature of the sheet metal involved, that the angled component formed by moulding 3 and metal insert 2 can yield elastically to a limited extent when it experiences shock loading from the exterior. If the externally applied shock loading exceeds a certain value, then this should result in an energy dissipating permanent deformation.

In accordance with the invention, the bumper corner section 1 is formed integrally with a motor vehicle light 4.

The metal insert 2 is formed integrally with a reflector 5, a bulb socket 6 and an earth lead 7. The moulding 3 is formed integrally with a light housing 8, a location 9 for a positive lead 10 and a locating groove 11 for a light glass 12. The knife-edged rim of the light glass 12 here cooperates in a sealing relationship with the V-section locating groove 11.

A conventional bulb 13 is received in the socket 6 and the light glass 12 is attached by screws 14 in the conventional way. The screw 14 can take the form of self-tapping screws which are screwed into pressed dimples in the metal insert 2.

The bumper corner section 1 is attached, via studs 15 and 18 welded to the ends of the metal insert 2, at one end to a substantially straight bumper centre section 16 and at the other end to a body 17 of the vehicle.

The lateral end of the bumper corner section 1 is formed with an extended portion 21 in which the stud 18 is embedded, the head of the stud 18 being held in the moulding 3

by the metal insert 2. The lateral end of the bumper corner section is attached to the vehicle body by inserting the stud 18 in the hole 19 moulded in the vehicle body 17 and securing it in position by a nut, the extended position 21 abutting the surface of the body 17 around the hole 19. The front end of the bumper corner section is joined with an extended portion 22 in which the stud 15 is embedded, the head of the stud 15 being held in the moulding 3 by the metal insert 2. The front end of the corner section is attached to the centre section 16 by inserting the stud 15 in a hole 23 formed in the centre section and securing it in position by a nut, the extended portion 22 abutting the surface of the centre section around the hole 23. The attachment means at each end of the corner section provide limited displacement and pivoting of the corner section relative to the body of the vehicle.

The attachment of the bumper corner section 1 at its forward end to the bumper centre section 16, will preferably be carried out in the manner shown in Figure 3, where once again limited pivoting of the stud 15' in relation to the bumper centre section 16' is possible. In the attachment means shown in Figure 3, the extended portion 22' has a cylindrical part 24 formed integrally with the moulding 3 and surrounding the shank of stud 15'. The corner section is attached to the centre section 16' by inserting the stud 15', together with the cylindrical part 24 in a hole 23' formed in the centre section and securing it in position by a nut and a bracket 25. The attachment of the bumper corner section 1 at its lateral end, to the body, can be carried out in the same manner shown in Figure 3.

The attachment of the bumper corner section 1 to the bumper centre section 16 and to the body 17 could equally, however, be made through correspondingly formed interlocking or clip attachments.

The attachment of the bumper corner section 1 to the centre section 16 and the body is carried out in such a manner that when small forces are applied to the corner zone of the said corner section 1, the latter can yield elastically.

In order to prevent damage to the glass

12 of the light under low impact loadings, the synthetic material moulding 3 is provided with projecting anti-shock beads 20 which laterally embrace the glass 12. The choice of the material of the glass 12 is made so that its sealing capability is not impaired by a temporary elastic deformation of the bumper corner section 1.

The bumper corner section in accordance with the invention has the advantage that a motor vehicle light can be installed in the corner section of the bumper without impairing the deflecting function of the corner section of the bumper.

#### WHAT WE CLAIM IS:—

1. A corner bumper section for motor vehicles adapted to be attached to a substantially straight bumper centre section, the corner bumper section comprising a synthetic material moulding with a metal insert and a motor vehicle light including a reflector, a bulb socket and an earth line formed integrally with said metal insert and a light housing, a location for a positive lead and a locating groove for a light glass formed integrally with said moulding.

2. A bumper section as claimed in Claim 1, wherein said moulding is provided with an anti-shock bead to protect the vehicle light.

3. A bumper section as claimed in claim 1 or 2, including attachment means to attach one end of the corner section to said centre section and other end to the body of the vehicle, said means providing limited displacement and pivoting of the corner section relative to the body of the vehicle.

4. A corner bumper section substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

5. A motor vehicle including a substantially straight bumper centre section, and a pair of corner bumper sections as claimed in any one of the preceding claims each corner section being attached at one end to the centre section and at its other end to the body of the vehicle.

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Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1976  
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

